Instructions for
THE POCKET COMPARATOR

Developed and Manufactured by:
BELL & HOWELL COMPANY

NATIONAL
Tools
CLEVELAND

Distributed by:
NATIONAL TOOL CO.
11200 Madison Ave., Cleveland 2, Ohio

INDIVIDUAL EYE FOCUS

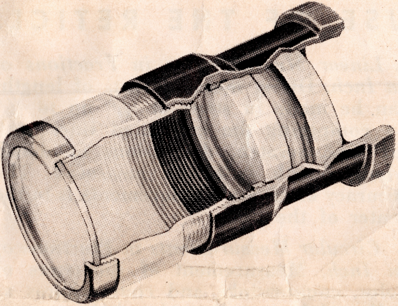
Adjust the instrument for your eye so that the reticle pattern will be in sharp focus the instant you look through the instrument.

Near-sighted persons will use the eyepiece threaded close to the reticle and far-sighted persons will rotate the eyepiece backward about eight full threads or revolutions. Once you have adjusted the focus for your eye you may leave it at this setting, permanently ready for instant use.

VIEWING THE WORK

Bring the surface of the reticle as close as possible to the work. Actual contact, taking care to eliminate excessive rubbing action, is best. This eliminates errors by eye-parallax.

For ease of reading a high level of



illumination is best. Hold the instrument by the eyepiece, taking care not to obscure the plastic window with your fingers. With sufficient illumination the instrument may even be placed with the reticle surface down on a flat opaque surface and the plastic window will transmit enough light so that precise measurement can be made.

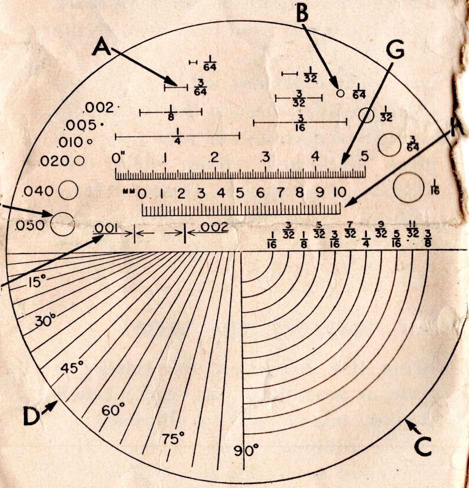
USE OF THE RETICLE

A *Linear Measurements in Fractions of an Inch.* Direct measurements of lengths can be made in steps of $\frac{1}{64}''$ up to $\frac{1}{4}''$ by comparing the graduated lines with the line, scratch, dimensions or defect whose length is to be measured. The accuracy on linear measurements is to the center of the line.

B *Circular Measurements in Fractions of an Inch.* Measurement of diameters of holes, countersinks and counterbores as well as defects such as blow holes in castings, pits, and digs in polished surfaces; flaws, bubbles and seeds in glass and plastic; may be made by superimposing the circle directly on the dimension or defect to be measured. Bear in mind that the lines comprising the circles on the reticle are .001″ in width. The stated diameters are accurate to the outside of the circles.

C *Radius Measurements.* To measure the radius of curvature of an object, place the radius pattern over the object to be

PATTERN



A
B
G
H
1/64
3/64
1/32
3/32
1/8
3/16
1/4
1/64
1/32
3/64
1/16
.002
.005
.010
.020
.040
.050
0"
.1
.2
.3
.4
.5
MM 0 1 2 3 4 5 6 7 8 9 10
.001
.002
1/16
3/32
1/8
5/32
3/16
7/32
1/4
9/32
5/16
11/32
3/8
15°
30°
45°
60°
75°
90°
D
C

checked, and match the arc with the closest curve shown. Curves falling between radii indicated on the reticle can readily be estimated. Measurements of radii smaller than 1/16″ can be made by use of the circles in the upper section of the reticle. The accuracy here is to the center of the line.

D *Angle Measurements.* To measure angles, place the work so that one side coincides with the base line of the protractor, and shift laterally until the other side of the work lines up with one of the lines on the protractor. This will give the angle between the sides of the work, as read on the lines of the protractor, which are calibrated in 5 degree intervals. Please note that the base line extends completely across the reticle to permit checking angles up to 180 degrees.

E *Narrow Line Width Measurements.* Superimpose the width lines over the line, scratch or defect, to be measured. A careful comparison with the .001″ and .002″ lines will give an accurate conception of the width of fine lines or scratches. For heavier lines, the .005″

linear rule can be used.

F *Circular Measurements in Decimals of an Inch.* This pattern compares with that described in *Item b* except that readings are graduated from .002″ to .050″ diameter. Here also the accuracy is to the outside diameter of the circle.

G *Linear Measurements in Inches.* Linear dimensions in steps of .005″ can be determined up to ½″ by superimposing the ½″ linear rule upon the work to be measured. With a little practice, reliable estimates can be made of lengths falling between the .005″ markings. As in *Item a* dimensions are accurate to the center of the line.

H *Linear Measurements in Millimeters.* Metric measurements can be determined up to 10 mm. in .2 mm. graduations. The proximity of this scale to the .005″ linear scale makes it convenient to measure either in mm. or inches, or to convert from one system to the other with virtually one measurement. As in other linear measurements the accuracy is to the center of the line.

CARE OF THE INSTRUMENT

Optical surfaces should be cleaned with a soft clean cloth. Alcohol or water may be used to dampen the cloth. Many Pocket Comparators have been given constant use under actual shop conditions at Bell & Howell for over five years without noticeable injury to reticle surfaces or changes in accuracy.

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